

## LIGHTER AND METHOD OF USE

## **BACKGROUND**

## Technical Field

The present application is directed to a lighter and method of use and, in particular, to a lighter with a safety device to prevent inadvertent ignition of the lighter and a method of using the lighter.

### Related Art

Many safety devices have been proposed to prevent inadvertent lighting of lighters, in particular by children. One such lighter is described in Korean Utility Model Registration 239686, which discloses an igniting lighter with a safety device provided at one side of an ignition button. In order to ignite the lighter, the safety device first must be unlocked, followed by depressing the ignition button. However, the safety device can be unlocked only by an intentional manipulation when carrying out the ignition. Further, after the ignition, the safety device has to be locked by an intentional manipulation. This can be inconvenient and more importantly, easily forgotten when a user is busy, defeating the purpose of having a safety lock.

Thus, there is need in the art for a lighter with an automatic safety feature to further decrease the possibility of inadvertent lighting, providing increased safety to users, especially children.

## SUMMARY

The present disclosure is directed to an ignition lighter particularly adapted as a barbecue-style lighter, in which the safety device is naturally unlocked by the fingers of

1       the igniting person during an ignition of the barbecue preparation apparatus, and the  
2       safety device is automatically locked after the ignition.

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4           According to the disclosure, the ignition lighter includes a safety device such that  
5       in use, the index finger supports the rear part of the lighter, and the safety button is  
6       disposed correspondingly to the index finger. Thus, when the ignition button is pushed  
7       by a user's thumb, the safety button is easily and naturally pressed in order to unlock the  
8       safety device, rendering ignition easier.

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10          In one embodiment, the lighter includes a housing, and an ignition button and a  
11       safety button extending through and supported by the housing. The lighter also includes  
12       a biasing member operatively connected to the safety button and to a fuel source, and an  
13       actuating member operatively connected to the ignition button and to an ignition source.  
14       When a force is exerted on both the ignition button and the safety button, the fuel source  
15       is opened and the ignition source is activated to light the lighter, and when the force on  
16       the ignition and safety buttons is released, the fuel source is closed, the ignition source  
17       is de-activated, and the safety button automatically returns to a locked or off position.

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19          In some embodiments, the actuation member includes a first actuating arm and a  
20       second actuating arm disposed angularly to the first, which is interlocked to the ignition  
21       button and constructed and arranged to be engaged to or disengaged from an engaging  
22       shaft of the safety button. The second arm is constructed and arranged to actuate the  
23       piezoelectric unit.

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25          In some embodiments the engaging shaft of the safety button extends to an up and  
26       downwardly sliding movable shaft, and a biasing member is disposed under the engaging

1 shaft, while a projecting shaft is formed under the engaging shaft for an accurate  
2 functioning of the biasing member.

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4 Some embodiments includes a separating wall to ensure that the engaging shaft  
5 moves vertically so that the biasing member is accurately seated.

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7                   The foregoing and other objects, features and advantages of the disclosure will be  
8                   apparent from the following more particular description of preferred embodiments of the  
9                   disclosure, as illustrated in the accompanying drawings in which like reference characters  
10                  refer to the same parts throughout the different views. The drawings are not necessarily  
11                  to scale, emphasis instead being placed upon illustrating the principles of the disclosure.  
12                  The principles and features of this disclosure may be employed in varied and numerous  
13                  embodiments without departing from the scope of the disclosure.

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## **BRIEF DESCRIPTION OF THE DRAWINGS**

16 The above object and other advantages of the present disclosure will become more  
17 apparent by describing in detail the preferred embodiment of the present disclosure with  
18 reference to the attached drawings in which:

19 FIG. 1 is a perspective view of an exemplary lighter according to the present  
20 disclosure;

FIG. 2 is a side view of the exemplary lighter shown in FIG. 1;

22 FIG. 3 is an enlarged sectional view of a portion of the lighter shown in FIGS.  
23 1 and 2 showing the safety button of the lighter in a locked or off position;

24 FIG. 4 is a sectional view showing a user unlocking the safety button of the lighter  
25 and pressing the ignition button; and

1                   FIG. 5 is a sectional view showing a user the safety button in an unlocked position  
2 and the ignition button in a depressed position, ready to ignite a flame.

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4                   DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

5                   FIGS. 1 and 2 show one exemplary embodiment of a lighter 10 according to the  
6 present disclosure. As shown, lighter 10 has a longitudinal housing 12 with an upper  
7 ignition end 12a and a lower end 12b opposite upper end 12a. An ignition button 14 and  
8 a safety button 16 both are supported by and extend through housing 12 between the  
9 opposing ends 12a,b. In a lighter according to the present disclosure, ignition button 14  
10 and safety button 16 are located in positions natural to where a hand would grasp the  
11 lighter and therefore, the locking and unlocking of the safety device are automatically and  
12 naturally carried out, thereby rendering the use of the lighter more convenient.

13                  As shown in FIG. 3, safety button 16 is supported on a moveable shaft 18  
14 positioned inside and adjacent to housing 12. Moveable shaft 18 is operably connected  
15 to and substantially parallel to an engaging shaft 20, from which a projecting shaft 22  
16 extends downwardly. A biasing member 24 which, in the present embodiment, is a coiled  
17 elastic spring, is positioned on projecting shaft 22 in between an underside 20a of  
18 engaging shaft 20 and an interior support structure 26, which acts as a spring seat. A  
19 separating wall 28 is positioned between engaging shaft 20 and ignition button 14 to  
20 ensure that engaging shaft 20 will slide downwardly in a vertical direction, and that  
21 biasing member 24 will accurately seat against support structure 26. Biasing member 24  
22 biases ignition button 14 upwardly in a normally locked position until released manually  
23 by a user as will be explained in greater detail below.

24                  Still referring to FIG. 3, an actuation member 28 is pivotally attached to housing  
25 18 at a pivot point 28p inside housing 18. As shown, actuation member 28 may be  
26 supported on an intermediate support structure 18a rather than directly to the interior of

1 housing 18. In the present embodiment, actuation member 28 is hingedly attached to  
2 support 18a. Actuation member 28 includes an upper actuation arm 28a and a lower  
3 actuating arm 28b, preferably positioned at an angle "A" with respect to one another, as  
4 illustrated.

5 FIG. 2 illustrates a locked or off position, in which biasing member 24 biases  
6 engaging shaft upwardly; actuation arm 28a is positioned adjacent to a piezoelectric unit  
7 30; and actuation arm 28b is positioned adjacent upper end 14a of ignition button 14  
8 while tip 29 of lower actuation arm 28b engages a sidewall 20w of engaging shaft 20.

9 In operation, as shown in FIGS. 4-5 when taken together, a user grasps housing  
10 18 and positions a thumb on ignition button 14, and a index finger on safety button 16 in  
11 a natural manner. The user exerts a force with the thumb to press ignition button 14, and  
12 causing the index finger to exert a downward force on safety button 12 in a natural  
13 manner, causing movable shaft 18 to move downwardly. At the same time, engaging  
14 shaft 20 moves downwardly, compressing biasing member 24. When ignition button 14  
15 is actuated, biasing member 24 is compressed and fuel is released from a reservoir (not  
16 illustrated). In addition, when biasing member 24 is compressed and a force is being  
17 exerted on ignition button 14, actuation member 28 then may pivot about pivot point 28p  
18 in the direction shown in the arrow. Thus, actuation arm 28a moves in an upward  
19 direction, which activates piezoelectric unit 30 and causes ignition of a flame due to a  
20 spark generated by piezoelectric unit 30.

21 Upon release of ignition button 14, the force on safety button 16 is also released  
22 simultaneously or shortly thereafter, causing biasing member 24 to be restored to a biased  
23 position (as shown in FIG. 3) in which the discharge of fuel from the reservoir is blocked,  
24 automatically suppressing the flame. At the same time, when safety button 12 is restored  
25 to its original position, actuation arm 22b of actuation member 22 re-engages engaging  
26 shaft 20, thereby placing the lighter in the locked or off position shown in FIG. 3.

1           While this disclosure has been particularly shown and described with references  
2           to preferred embodiments thereof, it will be understood by those skilled in the art that  
3           various changes in form and details may be made therein without departing from the spirit  
4           and scope of the disclosure as defined by the appended claims.